42. (Amended) A method of Claim 41 wherein the fusion molecule consists of (a) a peptide consisting of amino acids 12 to 88 of the hepatitis delta antigen (HDAg) or a fragment thereof that forms a coil and (b) at least two binding moieties, wherein one binding moiety is the first binding moiety and another binding moiety is the second binding moiety.

43. (Amended) The method of Claim 41 wherein the binding between binding partners occurs in solution.

44. (Amended) A method of Claim 41 wherein the fusion molecule is a subunit of a coiled-coil oligomer comprising at least of the same or different two fusion molecules.

REMARKS

The Amendments to the claims have been made to obviate certain objections and rejections offered by the Examiner. These objections and rejections will be addressed in detail below. In the event that this Amendment does not place the application in condition for allowance, an interview is requested with the supervisor of Art Unit 1645.

Restriction Requirement

The Office has granted Applicants' Petition under 37 CFR 1.144. Claims 1-2, 4-10, 16-21, 41-45 and 58 are pending and examined. The Examiner, on page 2 of the action, has omitted Claim 58 from the list of claims examined, although he has indicated that this claim has been allowed. It is believed that the error was unintentional. Claims 11-15, 22-40 and 46-57, withdrawn from consideration, have been canceled herein without prejudice.

Claim Objections

The Examiner has objected to Claim 1 in view of an obvious typographical error. The

error has been corrected.

The Examiner has objected to Claims 16, 20, 21, 42 and 44 for the use of the wrong article. He states that independent claims should start with the article "the", while dependent claims should start with the article "a" or "an". Claim 16, for example, is a dependent claim and begins with "a," as required by the Examiner. Thus, the objection is not understood. Perhaps the Examiner intended to say that dependent claims should begin with "the" and independent claims should begin with "a" or "an". Compare with Claims 1-6, for example, now allowed. In any event, absolutely no support for any objection, based upon the selection of an opening article, has been offered by the Examiner. It is not required by the Rules (see 37 CFR 1.75) or the MPEP (see MPEP 608.01). In fact, the MPEP gives examples of acceptable dependent claims which begin with the article "a". (See MPEP 608.01(n)). The objection is obviously inaccurate in its articulation. Thus, simple acquiescence to avoid the matter is impossible because it is uncertain whether the Examiner meant to object to the allowed claims (that employ the "wrong" articles in the Examiner's view) or whether the Examiner confused the articles in his objection. Further, the objection is not supported by any cited law, rule, precedent or printed policy statement. Withdrawal is requested.

Rejection of Claims 17-19 under 35 USC 112, first paragraph

The Examiner has rejected the claims under 35 USC 112, first paragraph, for the use of the term "derivative" in the claim. The word has been deleted from the claims. Withdrawal of the rejection is requested.

Rejection of Claims 7-10, 17, 19 and 44 under 35 USC 112, first paragraph

The Examiner has rejected the claims, stating:

> Claims 7-10, 17, 19 and 44 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejected claims are drawn to "coiled-coil oligomers" and a method of using said oligomers. Said oligomers comprise at least two fusion molecules wherein said fusion molecules comprise a peptide consisting of amino acids 12-88 of the hepatitis D antigen (HDAg) or a fragment thereof that forms a coil and at least one binding moiety.

> The specification discloses that said binding moieties can be cytokines, interferons, interleukins, T cell receptors, Fc receptors, plasminogen activators, MHC, tumor suppressor genes, monoclonal antibodies, fragments of antibodies, drug resistance genes and ion channels (among others). The specification also discloses that the coiled-coil sequence is located in the N-terminal third (amino acids 12-60) of the HDAg molecule and that residues 50-60 of said molecule are important in oligomer formation. Finally, the specification discloses that HDAg coiled-coil monomers form octamers. However, the specification is silent on what binding moieties, if any could be fused to said monomers and maintain a coiled-coil conformation. The specification is equally silent own what binding moieties, if any, would allow for octamer formation. Additionally, the specification gives no guidance on the techniques to be employed in "binding" said moieties to the HDAg or where on the HDAg molecule said moieties are attached. Consequently, given the lack of guidance and the lack of working examples within the specification, it would be impossible for one skilled in the art to make and/or use the claimed invention without undue experimentation.

Withdrawal of the rejection is requested. It is noted in the first instance that Claims 1-6, for example, have been allowed. These claims are directed to the coiled oligomers that form the coiled coils of Claim 7 et seq. The Examiner acknowledges that these claims are enabled.

The Examiner has offered absolutely no scientific or technical reasoning as to why the specification is not enabled. The Examiner states that "the specification is silent on what binding moieties, if any could be fused to said monomers and maintain a coiled coil conformation." This is simply not understood. As quoted above, the Examiner acknowledges that the specification teaches a large number of binding moieties that can be used. There is absolutely no reason to assume or infer from this specification that the listed binding moieties were not envisioned for the coiled-coil conformation (including the octamer). Indeed, that is the only reasonable reading of this specification. Thus, the specification is not silent on the binding moieties that can be employed but gives a very good list of those that can be used.

The Examiner states that the specification gives no guidance as to the techniques to be employed in "binding" said moieties to the HDAg or where on the molecule said moieties are attached. Again, the rejection is not understood. Immediately above this unsupported conclusion, the Examiner explicitly cites the preferred place of attachment and mode of attachment (e.g., as a fusion molecule). Claim 1 claims these molecules and has been found to be enabled and allowed. Claims 5 and 6, which describe two binding methods, have also been

allowed. Thus, the description of the method of "binding" the moiety to the oligomer and the location of binding is acknowledged by this same Examiner in this same Office action.

With respect to Claims 17 and 19, the claims are not directed to coiled coils, as such, but are directed to specific sequences which form the coiled oligomer and, upon contact with similar coiled oligomers, form a coiled coil. Thus, for the reasons that the Examiner deemed Claims 1-6 enabled, Claims 17 and 19 are also enabled.

The rejection appears to be an attempt by the Examiner to accomplish a de-facto restriction requirement under the guise of a rejection. The Examiner was directed to rejoin and examine these claims with Claim 1. These are claims directed to oligomers comprising two or more fusion molecules of Claim 1 and are, therefore, narrower in scope than the products of Claim 1. Thus, for the same reasons Claim 1 is allowable, these claims are allowable.

Rejection of Claims 41-45 under 35 USC 112, first paragraph

The Examiner has rejected the claims in view of the use of the terms "interaction" and "enhancing." Claim 45 has been canceled. Claims 41-44 have been rewritten to avoid the language objected to by the Examiner and use the term "binding", which has been previously accepted by the Examiner. Withdrawal of the rejection is requested.

Rejection of Claims 7-10, 16-21 and 41-45 under 35 USC 112, second paragraph

The Examiner has rejected Claims 7-10, 16-21 and 41-45 under 35 USC 112, second paragraph. The Examiner finds the use of the term "coiled coil" confusing. No explanation is offered. The Examiner appears to acknowledge that the term refers to the conformation of the product. The Examiner appears to acknowledge that specific HDAg amino acids are responsible for the formation of the coil and that the binding moieties are terminal thereto. The Examiner does not appear to be of the opinion that reference within the claims to a product's conformation is inherently improper. The specification, including the figures, make it abundantly clear that the monomers form a coil and these coils aggregate, as a coil, to form the coiled coil. (See, e.g., page 9, lines 21-26 and Figure 5.) There is absolutely nothing indefinite by the term. There is nothing which may suggest that the binding moiety must also form a coiled coil independently from the coil.

Claim 16, 20 and 21 were rejected as being indefinite for reciting a withdrawn claim. While this rejection is clearly improper, the claims have been canceled in an effort to simplify issues in prosecution and in light of the remaining claims that have been presented.

Claim 17 is rejected for the use of the term "depicted." While the rejection is not understood, the language suggested by the Examiner has been adopted in an effort to bring the prosecution to a close.

Claim 17 has been objected for the use of the term "or" in a Markush group. The claim has been amended to replace the word "or" with the word "and" to avoid this issue.

Claims 17-19 have been rejected for the use of the term "derivative". The word has been deleted from the claims.

Claims 41-43 have been rejected for the use of the terms "interaction," "presents", "ligands" and "surfaces". The claims have been amended to avoid the use of these terms and bring prosecution to a close.

Claim 45 is listed as subject to rejection under this heading, however it is not stated why the claim is rejected. As stated above, Claim 45 has been canceled.

Withdrawal of the rejection is requested.

The Rejection of Claims 17-19 under 35 USC 102

The claims have been rejected under 35 USC 102(b). The claims have been amended in a similar fashion as Claims 1-6, now allowed, to avoid the issues raised. Withdrawal is requested.

Interview Summary Record

The Interview Summary Record states that the Applicant indicated that it was "acceptable" that the USPTO issue an additional Office Action in light of the rejoinder of the claims. For the sake of clarity, Applicants requested that the Examiner discuss any potential rejections with the undersigned in advance of issuing any Office Action. Applicants indicated a strong desire to make any conforming amendments desired by the Examiner to avoid the need for, and expense of, an additional Office Action and Reply. The Examiner denied this request and issued this Office Action. Indeed, had the Examiner agreed to the Applicants' request, many, if not all, of these issues could have been avoided.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned at (978) 341-0036.

Respectfully submitted,

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By _____

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Dated: 3/4/3

MARKED UP VERSION OF AMENDMENTS

Claim Amendments Under 37 C.F.R. § 1.121(c)(1)(ii)

1. (Thrice Amended) A fusion molecule consisting of (a) a peptide consisting of amino acids 12 to 88 of the hepatitis delta antigen (HDAg) or a fragment thereof that forms a coil and (b) at least one binding moiety.

17. (Twice Amended) An isolated and purified fusion molecule [comprising] consisting of:

(a) a polypeptide having an amino acid sequence selected from the group consisting of an amino acid sequence [depicted in] selected from the group consisting of SEQ ID NOS:1-8, amino acids 12 - 48 of SEQ ID NOS:1-8, amino acids 12 - 60 of SEQ ID NOS:1-8, SEQ ID NO:9 , SEQ ID NO:11, amino acids 12 - 48 of SEQ ID NO:11, amino acids 12 - 60 of SEQ ID NO:11, SEQ ID NOS:15-17, SEQ ID NOS:18-20, [and] SEQ ID NO:25, and fragments [or a fragment or derivative] thereof which form a coiled-coil oligomer and

(b) at least one binding moiety.

18. (Amended) A [derivative of an HDAg] peptide consisting of amino acids 12 to 88 of the hepatitis delta antigen (HDAg) wherein a serine residue is substituted with cysteine.

19. (Amended) An isolated and purified molecule comprising a polypeptide consisting of [comprising] an amino acid sequence of amino acids 12 - 88 of HDAg, or a fragment [or derivative] thereof which forms a coiled-coil oligomer and a nuclear localization signal.

41. (Amended) A method of [enhancing interaction between] binding binding partners comprising contacting a fusion molecule of Claim 1 having a first binding moiety with a second binding moiety, wherein the first and second moieties are binding partners, under conditions suitable for binding.

42. (Amended) A method of Claim 41 wherein the fusion molecule consists of (a) a peptide consisting of amino acids 12 to 88 of the hepatitis delta antigen (HDAg) or a fragment thereof that forms a coil and (b) at least two binding moieties, wherein one binding moiety is the first binding moiety and another binding moiety is the second binding moiety [presents the first and second binding moieties].

43. (Amended) The method of Claim 41 wherein the binding [interaction] between binding partners [ligands] occurs in solution [, on membranes or on surfaces].

44. (Amended) A method of Claim 41 wherein the fusion molecule is a subunit of a coiled-coil oligomer comprising at least of the same or different two fusion molecules [and the first and second moieties are bound to the oligomer].